MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2015 / 2016

PCO 0165 – INTRODUCTION TO COMPUTER ARCHITECTURE AND OPERATING SYSTEM

(Foundation in Information Technology)

10 OCTOBER 2015
2.30 p.m. - 4.30 p.m.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 3 pages (excluding the cover page) with 6 questions only.

2. Attempt **FIVE** out of **SIX** questions. All questions carry equal marks and the distribution of the marks for each question is given.

3. Please write all your answers in the Answer Booklet provided.

Instructions: Attempt **FIVE** out of **SIX** questions. Write your answers in the Answer Booklet.

QUESTION 1 [10 Marks]

a. In order to be a good "software designer" we need to understand how to improve code performance. We often ignore architecture when doing high level programming. Explain briefly why a software designer has to study computer architecture.

(3 marks)

b. List **FOUR (4)** examples of computers developed in the first generation which use vacuum tubes technology.

(2 marks)

c. List and briefly explain the main structural components of a processor.

(4 marks)

d. State **TWO (2)** features of the Intel Xeon.

(1 mark)

QUESTION 2 [10 Marks]

a. List the full name of the **TWO (2)** popular coding schemes to represent data in a computer.

(2 marks)

b. Convert the following binary numbers to decimal equivalents. Show computation steps.
   i. 10111_2
   ii. 10101010.001_2

(3 marks)

c. Solve the following addition operation using the two's complement addition in 5-bit for signed integer. Show computation steps.
   i. 8 + (- 5)
   ii. (-4) + (9)

(3 marks)

d. Assume that you have an AND gate with three inputs, X, Y and Z. Determine the output (E) for the following questions.
   i. X = 1, Y = 0, Z = 0
   ii. X = 1, Y = 1, Z = 1

(2 marks)

Continued ...

QUESTION 3 [10 Marks]

a. Solve the following subtraction operation using the two's compliment subtraction rule in 4-bit for signed integer. Show computation steps.
   i. 7 - (- 5)
   ii. (- 7) - (- 3)

(3 marks)

b. Calculate the addition arithmetic operation of the following unsigned binary numbers. Show computation steps.
   i. 11111001 + 00000101
   ii. 11011101 + 00001100

(2 marks)

c. Convert the following hexadecimal notation to their binary equivalents. Show computation steps.
   i. $49D.B7_{16}$
   ii. $3C8.A5_{16}$

(2 marks)

d. What is indirect addressing mode? Give one example of computer instruction that uses this mode and explain it.

(3 marks)

QUESTION 4 [10 Marks]

a. Give **TWO (2)** differences between high level language and low level language.

(2 marks)

b. List **FOUR (4)** characteristics of RISC computer.

(4 marks)

c. In typical assembly language format, list the **FOUR (4)** fields involved.

(2 marks)

d. Explain the meaning of the following assembly language instructions code.
   i. MOV B, A
   ii. LDA 4020H

(2 marks)

QUESTION 5 [10 Marks]

a. Describe the features of second generation of operating system.

(2 marks)

b. Briefly explain what is multithreading operating system.

(2 marks)

Continued ...

c. What are the **TWO (2)** common types of user interface used in operating system?
(2 marks)

d. The operating system is responsible for the **FOUR (4)** activities in connection with process management. List the activities.
(4 marks)

QUESTION 6 [10 Marks]

a. Briefly discuss the functions of the following utility programs.
   i. File manager
   ii. Diagnostic utility
(2 marks)

b. Screen savers originally were developed to prevent a problem called ghosting. Briefly explain the term ghosting.
(2 marks)

c. The simplest directory structure is a single-level directory. Sketch an example of this directory and briefly explain it. Then, give **TWO (2)** limitations of this directory structure.
(4 marks)

d. Explain briefly the indexed allocation technique of file allocation methods in the file system.
(2 marks)

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